

AUG 17 2009

AMENDMENTS TO THE CLAIMS:

What is claimed is:

1. (Currently Amended) A process for making a gradient material, comprising the steps of:

employing a screw extruder system comprising material rate input conditions, operating conditions, and hardware element configurations;

employing multiple feed streams of raw ingredients at variable, feed rates for compounding into a final material;

introducing disturbances into at least one of the feed streams by altering at least one of the material rate input conditions and the operating conditions, in conjunction with a predetermined hardware element configuration of the hardware element configurations; and

producing a final material comprising a compositional gradient in an architecture of the final material,

wherein said final material is a gradient material formed by segmented elements of the screw extruder system, and

wherein the disturbances are selected from at least one of the group of step disturbances, linear ramp disturbances, and non-linear ramp disturbances to form the compositional gradient.

2. (Original) The process of claim 1, wherein the screw extruder system comprises a twin screw extruder system.

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3. (Canceled)

4. (Previously Presented) The process of claim 1, wherein said at least one of the material rate input conditions is disturbed.

5. (Previously Presented) The process of claim 1, wherein said at least one of the material rate input conditions comprises at least one ingredient feeding rate.

6. (Previously Presented) The process of claim 1, wherein said at least one of said operating conditions is disturbed.

7. (Previously Presented) The process of claim 1, wherein said at least one of said operating conditions is selected from the group of a screw speed, system temperature, system pressure, or a combination thereof.

8. (Previously Presented) The process of claim 7, wherein said at least one operating condition comprises the screw speed.

9. (Previously Presented) The process of claim 2, wherein the hardware element configurations are selected from at least one of the group of a screw geometry, die geometry, and ingredient feeding locations.

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10. (Previously Presented) The process of claim 1, wherein said producing comprises continuously outputting the final material as a gradient polymer composite with a radial architecture of the compositional gradient.